

the law of equipartition has never been proved for purely dynamical systems, and is probably not in general true, it is not surprising that it fails when applied to the æther.

The Zeeman effect is discussed in chapter iii., and the author is chiefly concerned in showing how little progress has been made in elucidating the phenomena, and how much knowledge of atomic structure we may reasonably hope to gain from study of the facts.

The electron theory of dispersion is next dealt with. Probably most readers will regret that the author has not found it possible to enter more fully on the problem of the optical properties of metals.

Optical phenomena in moving bodies forms the subject of the last chapter. The explanation of Fresnel's hypothesis on an electromagnetic basis is one of the most important results contributed by Lorentz to optical theory. The explanation of the result of the Michelson-Morley experiment and of the double refraction experiment by Lord Rayleigh and Brace, forms most interesting reading. The hypothesis of a contracted electron is introduced, and with it the question of electric inertia is again raised. The chapter closes with an exposition of Einstein's principle of relativity.

The book is a most fascinating one, and to those acquainted with Lorentz' former memoirs, it is unnecessary to say that it is written with a lucidity that characterises a master hand.

We venture to offer some observations on the view that negative electrons possess an inertia which is entirely of electric origin. It appears to us that the proof requires considerably more support, both on the experimental and on the theoretical side, than it has yet received.

For many purposes it is unnecessary to define an electron further than to say that it possesses a charge. But when we come to the question of inertia we have to define the size and shape of the electron. Surface conditions are, of course, determined by the fundamental equations. We confine attention to the two cases considered by Lorentz, viz., the "rigidly" electrified sphere of Abraham and the contracted electron of Lorentz. It has been claimed that Kaufmann's experiments agree with the spherical electron formula and the view that the ordinary inertia is *nil*. As a matter of fact, his experiments agree very much better with the contracted electron formula, but make the ordinary inertia quite comparable with the electric inertia for slow speeds. Bucherer's experiments also agree with the contracted electron formula, and make the ordinary inertia *nil*, but the speed was not so high as in Kaufmann's experiments. On the theoretical side it must be remembered that both formulæ are derived from the energy of the steady state, using the "quasi-stationary state" principle. This principle has been acknowledged as quite unsound, and it must in general lead to false results, when, as in the present case, any change of velocity is attended with radiation into the medium. We have reason to believe that any change of velocity is accompanied by a redistribution of the charge on the electron, and this in general leads to an expression for the inertia which

differs from that obtained by differentiating the energy of the steady state.

We may well hesitate to sweep away the last scrap of ordinary matter from an electron until the proof rests on some principle more convincing than that of the quasi-stationary state.

#### OUR BOOK SHELF.

*Handbook of Marks on Pottery and Porcelain.* By W. Burton and R. L. Hobson. Pp. xii+210. (London: Macmillan and Co., Ltd., 1909.) Price 7s. 6d. net.

THIS volume supplies a distinct want. Mr. Burton is a practical potter, and the author of numerous works on the history of pottery and porcelain. Mr. Hobson is on the British Museum staff, and there are few men with greater chances of seeing and studying examples of all periods of pottery. The authors, therefore, speak with authority on subjects connected with ceramics, and although they style it a "reliable pocket volume," it is really a valuable and interesting addition to the bookshelves of collectors and students of pottery. Thousands of authentic marks will, of course, not be found in the volume, but those chosen are, on the whole, thoroughly representative, and the elaborate indices make the work of reference easy.

It is interesting to note the influence that one factory had on another, as shown by the marks. The Meissen factory was the father of European porcelain. The Cross Swords from the arms of Saxony, which was used there as their mark, can be seen in Caughley Tournay, Worcester, Derby, and Bristol. Even Meissen itself had in its early days, like so many other factories, marks in imitation of the oriental.

The short descriptions and the introduction are models of *Precis* writing, giving in a page or two the history of potting in each country. There is a little confusion in the use of the terms "hard and soft." Hard paste is fired at a high temperature, and the glaze is fired at the heat at which the porcelain matures. Soft paste, on the other hand, is fired at a lower temperature, and the glaze at a still lower one. The terms hard and soft have nothing to do with the hardness and softness, as usually understood. So far as the body of the piece of ware is concerned, some hard paste may scratch with a file more easily than soft.

The Oriental section is particularly good. It displays very great care, and is a decided advance on anything of a similar kind that has been within the reach of an ordinary collector.

The scheme of the work takes the reader through the various countries, and the period covered extends from the Middle Ages to about 1850, with a selection of modern marks. It is a very great advantage to have the authors' assurance that none but undoubted marks are illustrated in the volume. Great care seem to have been taken with the dates also, but on page 33 the A. R., the cipher of Augustus of Poland, the patron of Bottger, is given by the author as 1725-40. Most authorities, and with reason, place this mark considerably earlier.

*The Races of Man and their Distribution.* By Dr. A. C. Haddon, F.R.S. Pp. x+126. (London: Milner and Company, Ltd., n.d.) Price 1s. net.

THIS book gives a description of the various races of mankind as complete as appears to be possible within the compass of a small volume. The physical characters and culture of each race are described as far as it is at present known, and the author has in many cases to confess that the knowledge is, as yet, very incomplete. In the general classification of mankind the character of the hair is taken as a

primary feature. The three great divisions of mankind obtained in this way are subdivided according to stature or the shape of the head. Whether this is the ideal method of classification or not, it serves as a basis for the orderly description of the various known races. The description of the supernatural beliefs, weapons, houses, &c., of the Oceanic peoples is especially full and complete.

The latest views on the African races and their relations to each other are clearly set out. The native races of Asia are described, though an unduly large proportion of the treatise appears to be devoted to Indian races. The description of European races is comparatively superficial. So little appears to be known about the physical characters of the native races of the American continent that the author adopts a geographical classification, which makes it somewhat difficult to realise the physical relations of these races to each other. Some of Dr. Haddon's views on the relations of races to each other would be disputed by the latest authorities; for example, the view that the Tasmanians belonged to the same race as the Papuans would hardly, we think, be accepted by Prof. Sollas.

There are ten plates of representative members of leading races, and a very useful glossary of ethnological terms at the end of the book. The value of the book to a beginner in ethnology would have been considerably enhanced if it had contained a few maps. This little book is a welcome contribution to anthropological literature, and contains much valuable and accurate information not otherwise easily accessible.

- (1) *Der menschliche Organismus und seine Gesunderhaltung.* By Dr. A. Menzer. Pp. 159. (Leipzig: Quelle and Meyer, 1909.) Price 1.25 marks.
- (2) *Unsere Sinnesorgane und ihre Funktion.* By Dr. E. Mangold. Pp. vii+147. (Leipzig: Quelle and Meyer, 1909.) Price 1.25 marks.
- (3) *Die moderne Chirurgie für gebildete Laien.* By Dr. H. Tillmanns. Pp. iv+156. (Leipzig: Quelle and Meyer, 1908.) Price 1.25 marks.
- (4) *Die Geschlechtskrankheiten, ihr Wesen, ihre Verbreitung, Bekämpfung und Verhütung.* By Prof. Schumburg. Pp. vi+102. (Leipzig: B. G. Teubner, 1909.) Price 1.25 marks.

THESE four little books are examples belonging to two series of publications, which embrace a number of works on religion, philosophy, literature, art, history, geography, science, &c. They give a clear, concise and popular exposition of the various subjects with which they deal. From our insular standpoint in some instances certain subjects are discussed in a more open manner than we are accustomed to.

In the first book on the list, after a brief description of the anatomy, histology, and physiology of man, the various subjects of the causation of disease, infectious diseases, clothing, food, and general hygiene are simply and adequately described.

In the second book, the various organs of the special senses, sight, hearing, smell, taste, and touch, are described, and the mechanism of their action, so far as is known, is detailed. In "Modern Surgery" the reader is introduced to surgical theory and practice as regards the Röntgen rays, anæsthesia, arrest of hæmorrhage, sterilisation and antiseptics, preparation for operation, microorganisms, and their relation to disease, inflammation, burns, wounds, cancer, &c. The book would form an excellent little text-book for nurses.

The fourth book deals in a very outspoken manner with the subject of venereal diseases, their consequences, spread, and prevention. The diseases are briefly described, the various measures of prevention detailed, and the social evils of prostitution and their

remedy are discussed. We should consider it hardly advisable to place such a book in the hands of the general educated public, unless the reader had actual need to study the question with which it deals. All the books are clearly printed and freely and adequately illustrated.

R. T. H.

*Plant Galls of Great Britain. A Nature-Study Handbook.* By Edward T. Connold. Pp. xii+292. (London: Adlard and Son, 1909.)

THIS volume will certainly prove to be of great use to all students of insect and plant life. The author's previous works, viz., "British Vegetable Galls," published in 1901, and "British Oak Galls," published in 1908, are already well known. The present book is intended for the pocket as a guide in the field to botanists and collectors. The descriptions are condensed and brief, but Mr. Connold has not forgotten the value of good illustrations, and each description is accompanied by an excellent and typical photograph of the gall described. As the author points out, the systematic study of all British plant galls is as yet by no means complete. The subject offers a wide and interesting field for further research. This volume is well adapted to create an interest in these interesting vegetable structures, and to encourage the beginner to pursue his studies further.

The opening chapters give ample directions as regards the time when, the place where, and the manner how, to collect and study the various galls. The gall-producers, their habits and the principles of gall formation, are also adequately dealt with.

The list of English and Latin names of the host plants mentioned in the volume will be found of great use in the field. The various nomenclatures are becoming a vexed question, and a useful list of synonyms of gall producers has, therefore, been included, and at the end a very full index is given. The book cannot fail to serve its purpose as a field companion for the practical student of nature.

*The Rhodesian Miner's Handbook.* By F. P. Mennell. Second edition. Illustrated. Pp. 167. (Buluwayo: Ellis Allen, 1909.) Price 5s.

THIS is the latest of a series of books issued from the Rhodesia Museum. They are presumably intended to interest and instruct the settlers in the country, and to promote the prosperity of the industries of Rhodesia. Looked at in this light it may be that the book under review was well worth producing, and will be useful to its readers, but it is of little interest except to a prospector who has had no scientific training. It contains chapters of an elementary character on geology, mineralogy, ore deposits, prospecting, &c., and a quantity of miscellaneous information as to the present condition of the mining industry in Rhodesia. This is divided into sections, under the heads of precious metals, base metals, precious stones, and coal. The relative importance of the industries is indicated by the fact that in 1907 the gold represented nearly 94 per cent. of the total mineral production, and amounted in value to 148l 15s. per head of the white population, as compared, for example, with about 100l. per head in the Transvaal, and 26l. per head in Western Australia.

*Los Métodos de Integración.* By Carlos Wargny. Pp. 234. (Santiago de Chile: Cervantes, 1907.)

It is interesting to find that Spanish students in Chile study the integral calculus: otherwise this compilation calls for no special remark. It contains a collection of elementary examples of indefinite integration, many of which are worked out in elaborate detail. On pp. 128-9 Gregory's series and the expansion of arc sin  $x$  are given, without proper indication of the limits of the integrals from which they are derived.